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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/560,819

04/28/2000

Hiroshi Oagawa

1982-0149P

5103

7590

03/08/2005

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EXAMINER

ROY, SIKHA

ART UNIT

PAPER NUMBER

2879

DATE MAILED: 03/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No. 09/560,819	Applicant(s) OAGAWA, HIROSHI	
	Examiner Sikha Roy	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-8,10,12,14 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-8,10,12,14 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The Amendment, filed on December 13, 2004 has been entered and is acknowledged by the Examiner.

Cancellation of claim 15 and addition of new claim 16 have been entered.

The indicated allowability of claims 1,3-8,10 and 12 is withdrawn in view of the newly discovered reference. Rejections based on the newly cited reference follow.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1,3-8,10,12,14 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claim 1 the limitation reciting the 'the thickness of the uppermost layer is increased relative to a layer beneath' is vague as lacking what specific structure of the layer beneath is compared to and hence renders the claim indefinite. For continuation of examination the limitation is interpreted as ' the thickness of the uppermost layer is increased relative to the thickness of a layer beneath'.

Claims 3-8,10,12 are rejected because of their dependency from claim 1.

Regarding claim 14 the limitation reciting the 'the thickness of the uppermost layer is decreased relative to a layer beneath' is vague as lacking what specific

Art Unit: 2879

structure of the layer beneath is compared to and hence renders the claim indefinite.

For continuation of examination the limitation is interpreted as ' the thickness of the uppermost layer is decreased relative to the thickness of a layer beneath'.

Claim 16 is rejected because of its dependency status from claim 14.

Claims 10 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 10 and 12 the limitation reciting the thickness of each phosphor layer is in the range of 20-500 μm (for claim 10, 50-300 μm for claim 12) is inconsistent regarding the limitation of the thickness of the uppermost layer is increased relative to the thickness of the layer beneath as claimed in claim 1. For example if the thickness of the lower layer is 500 μm , the thickness of the upper layer is also the same, 500 μm being the upper most value of the range of thickness and this is inconsistent with the limitation of claim 1.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2879

Claims 1, 3, 5 - 8, 10, 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 4,979,200 to Umemoto et al. and further in view of JP 08313699 A to Ohara et al.

Regarding claim 1 Umemoto discloses (column 1 lines 58-68, column 2 lines 1-5) a radiation image conversion panel (radiographic intensifying screen) comprising phosphor layers containing stimuable phosphors (X-ray phosphors) and binder resin where the binder resin is unevenly distributed in the phosphor layer so that the amount of the binder resin to the stimuable phosphor in the uppermost layer (in the vicinity of the protective layer) is greater than that of the binder to the phosphor in the remainder of the phosphor layers. Umemoto further discloses (column 3 lines 25-30) that in order to obtain adequate adhesive strength between the uppermost phosphor layer and the protective layer the proportion of binder resin to stimuable phosphor is preferably at least 4% by weight of the entire phosphor layers which is certainly more than 0.5 wt.% as claimed.

Umemoto fails to disclose the thickness of the uppermost layer is increased relative to the thickness of the layer beneath the uppermost layer.

Ohara discloses (abstract, English translation sections [0041] – [0043]) the thickness of phosphor layers (fluorescent layer) mixed with binder changes with the property of radio-sensitization screen made for a purpose, the thickness of phosphor layer differs in every layer and the thickness of the uppermost layer is increased (becomes thin gradually towards the base material side from top protective layer side)

Art Unit: 2879

relative to the thickness of the layer beneath. Ohara discloses this configuration yields an image of enhanced sensitivity, sharpness and graininess.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have the thickness of the uppermost phosphor layer of Umemoto increase relative to the thickness of the layer beneath as suggested by Ohara for yielding a radiation panel with an image of enhanced sensitivity, sharpness and graininess.

Claim 1 differs from Umemoto in that Umemoto does not disclose the limitation of "radiation image conversion panel produced by thermo-compressing two sheets which have been separately coated and dried ". The Examiner notes that this limitation is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). Therefore, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art that the radiation image conversion panel disclosed by Umemoto and Ohara is at least a fully functional equivalent to the Applicant's claimed invention as evidenced by all of the Applicant's claimed structural limitations.

Referring to claim 3 Umemoto discloses the amount of the binder resin to the stimuable phosphor in uppermost layer is greater than that of the binder to stimuable phosphor in other layer by a range of from 4 to 8% by weight.

Art Unit: 2879

Referring to claim 5 Umemoto discloses (column 2 lines 24-50) the stimuable phosphor employable in the radiation image conversion panel includes bivalent europium activated alkaline earth complex fluoro-halide phosphor, a rare earth oxy-halide phosphor.

Regarding claim 6 Ohara discloses (English translation section [0025]) the stimuable phosphor grain size (mean particle diameter) is in the range of 1 through 20 μ m.

Regarding claim 7 and 8 Umemoto discloses (column 2 lines 60-68, column 3 lines 1,2) the thermoplastic elastomer binders can be selected from polyvinyl acetate, polyurethane, linear polyester.

Regarding claim 10 Ohara discloses (English translation section [0043]) the thickness of phosphor layer is in the range of 20 μ m to 1000 μ m.

Regarding claim 12 Ohara discloses the thickness of the phosphor layer is in the range of 50 through 300 μ m.

Regarding claim 14 Umemoto discloses all the limitations which are same as of claim 1 including the proportion of binder resin to stimuable phosphor at the uppermost layer is preferably greater by at least 4% by weight of that in other phosphor layers which is certainly more than 0.5 wt.% as claimed.

Umemoto fails to disclose the thickness of the uppermost layer is decreased relative to the thickness of the layer beneath the uppermost layer.

Ohara discloses (abstract, English translation sections [0041] – [0043]) the thickness of phosphor layers (fluorescent layer) mixed with binder changes with the

Art Unit: 2879

property of radio-sensitization screen made for a purpose, the thickness of phosphor layer differs in every layer and the thickness of the uppermost layer is decreased (becomes thick gradually towards the base material side from top protective layer side) relative to the thickness of the layer beneath. Ohara discloses this configuration yields an image of enhanced sensitivity, sharpness and graininess.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have the thickness of the uppermost phosphor layer of Umemoto decrease relative to the thickness of the layer beneath as suggested by Ohara for yielding a radiation panel with an image of enhanced sensitivity, sharpness and graininess.

Claim 14 differs from Umemoto in that Umemoto does not disclose the limitation of "radiation image conversion panel produced by thermo-compressing two sheets which have been separately coated and dried ". The Examiner notes that this limitation is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (see MPEP 2113). Therefore, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art that the radiation image conversion panel disclosed by Umemoto and Ohara is at least a fully functional equivalent to the Applicant's claimed invention as evidenced by all of the Applicant's claimed structural limitations.

Art Unit: 2879

Regarding claim 16 Ohara discloses (English translation sections [0012], [0041]) the panel comprising multilayers (3 through 10) containing stimuable phosphor and binder.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over U. S. Patent 4,979,200 to Umemoto et al. in view of U.S. Patent 5,519,228 to Takasu et al.

Claim 4 differs from Umemoto in that Umemoto does not disclose the wavelengths in the range of 300 to 500 nm of the radiation emitted from the stimulated phosphor when irradiated with rays of wavelength in the range of 400 to 900 nm.

Takasu in analogous art of radiation image conversion panel discloses (column 4 lines 25-31) a stimuable phosphor such as divalent europium activated alkaline earth metal halide phosphor giving a stimulated emission of wavelength in the range of 300 to 500 nm when it is irradiated with stimulating rays of wavelength in the range of 400 to 900 nm is employed. It is well known in the art of radiation image panel to employ radiation of 400-900nm wavelength passing through the object and sequentially exciting the phosphor in the panel.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to specify the wavelength of 400 to 900 nm of the irradiating radiation as taught by Takasu in the radiation image conversion panel of Umemoto. The stimuable phosphor used in the radiation panel of Umemoto being the same stimuable phosphor (divalent europium activated alkaline earth metal halide phosphor) as disclosed by

Art Unit: 2879

Takasu would inherently emit radiation of wavelength in the range of 300 to 500 nm when irradiated by radiation of 400-900nm wavelength.

Response to Arguments

Applicant's arguments with respect to claims 1 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent 6,486,477 to Suzuki et al. discloses plurality of phosphor layers in a radiographic intensifying screen. U.S. Patent 4,704,538 to Kitada discloses in a radiographic intensifying screen thickness of the phosphor layer varies depending upon the characteristics of the screen, the nature of phosphor, the ratio between the binder and phosphor.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (571) 272-2463. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (571) 272-2457. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

Art Unit: 2879

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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